October 14, 2004

Dr. Jeffrey Runge, Administrator
National Highway Traffic Safety Administration
U.S. Department of Transportation
400 7th Street, S.W.
Washington, D.C. 20590

Comments on Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 *et seq.*, May 17, 2004

Dear Administrator Runge,

Public Citizen is pleased to have the opportunity to comment on the National Highway Traffic Safety Administration's (NHTSA) proposed standard on side impact protection. While we agree with many aspects of the agency's proposal, there are still many significant issues that must be addressed in the final rulemaking to ensure an effective safety standard and adequate side impact protection for the occupants of passenger vehicles.

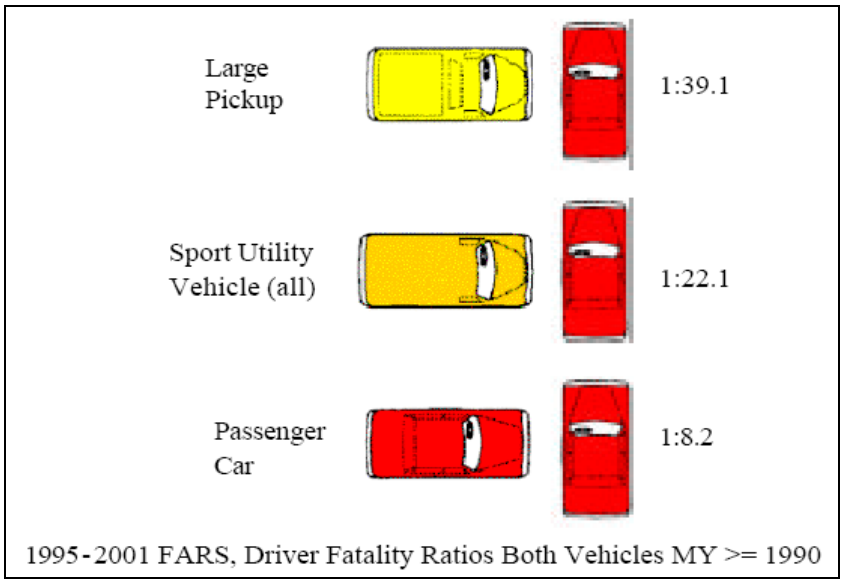
For the past several years, testing by the Insurance Institute for Highway Safety (IIHS) and European researchers have shown the remarkable effectiveness of side impact air bags in reducing deaths and serious injuries, and have shown that in many cases, side impact air bags are the difference between life and death. Given the dramatic conclusions in the data and the reliance thus far on spotty and haphazard voluntary action by automakers, the agency's action is long overdue.

Over 9,000 people die in side impact crashes every year.[1] And these numbers, tragically, do not even tell the whole picture. The growing popularity of SUVs and pickup trucks — now making up over half of new vehicle sales — greatly exacerbates risks for the occupants of passenger cars hit in the side by them.

The high, heavy and rigid construction of SUVs and pickups already makes them deadly in head-on collisions with passenger cars, killing three car occupants for every light truck occupant killed. According to NHTSA's own 2003 Annual Assessment, an even greater risk discrepancy exists between light truck deaths and death rates for occupants of cars struck in the side by light trucks.

When SUVs or pickups are hit in the side by passenger cars, the people in the light truck are at a 1.5 times greater risk of dying than the car occupants. But when the vehicle roles are reversed and the striking vehicle is a light truck, the occupants in the struck passenger car have a shocking *24 times* greater risk of being killed than the people in the truck.[2] Light trucks clearly pose a tremendous and unacceptable danger to passenger car occupants in side impact crashes.

Certain types of light truck are particularly devastating in side impact crashes with passenger cars. When a passenger car is struck in the side by an SUV, the car driver has a 22 times greater fatality risk than the SUV driver. And when a passenger car is struck in the side by a large pickup truck, the car driver is almost *40 times* more likely to die than the pickup driver.[3]



1995-2001 FARS, Driver Fatality Ratios Both Vehicles MY >= 1990

Overall, Public Citizen commends NHTSA on finally proposing an updated and improved side impact safety standard that will effectively require the installation of head protection side impact air bags. However, there are important flaws in the proposed standard that would undermine the goal of effective side impact crash protection for passenger vehicle occupants.

Incorporation of our concerns and recommendations into the final rulemaking would significantly enhance the value of the standard and save many more people from death and severe injury in side impact crashes:

- The pole test should be required for both rear and frontal seating areas.
- NHTSA should consider limiting intrusion in the pole test, in addition to the test dummy injury criteria.
- Test dummy injury response data should take into consideration the higher vulnerability of older occupants.
- The agency should include a child dummy in the standard's test procedures.

- The impact measurement capabilities of the SID-IIsFRG 5th percentile female dummy should be equivalent to those of the ES-2re 50th percentile male dummy.
- The allowable head injury threshold should be reduced.
- If the MDB test is to continue as part of the standard, it should reflect the contemporary fleet of vehicles, with its large population of light trucks, and therefore be significantly more severe.
- The proposed exemptions for certain vehicles are dubious at best.
- NHTSA should begin the phase-in of the pole test in 2007, not 2009.

Each issue of interest is addressed in turn below.

Basic Features of Pole Test Are Excellent

Public Citizen agrees with many aspects of the agency proposal. The proposed 75-degrees oblique angle pole test at 20 mph is especially laudable. The test sets out an appropriately protective standard, bridging the entire height of the test vehicle from the sill to roof line — like the depth of intrusion that occurs when passenger cars are hit in the side by a large, high pickup truck or SUV.

The pole test as proposed by NHTSA with our fullest support would, in effect, necessitate installation of side impact air bags to meet the injury reduction requirements for head and torso injuries. This is a critical step, because 20 percent of fatalities and serious injuries in side impact crashes involve fixed narrow objects, as the agency reports in its notice, and 40 percent of all deaths and injuries in side impact crashes involve head injuries.[4]

The agency's pole test would finally prevent automakers from complying with side impact head protection standards by merely increasing the foam or padding on the inside of the vehicle. Side impact air bags, unlike padding, will save many lives. Recent testing by IIHS indicates that side impact protection air bags can reduce occupant fatality risk by nearly 50 percent, and, in many cases, can provide, literally, lifesaving benefits in side impact crashes with SUVs.[5] Moreover, the pole test proposed by NHTSA is almost certainly more effective in ensuring better side impact protection than the IIHS test, which involves a moving deformable barrier (MDB) and is not sufficiently rigorous.

Much of the Dummy Kinematics and Measurement Capabilities are Correct

Despite certain reservations regarding the adequacy of the SID-HIIsFRG dummy's chest deflection and pubic symphysis impact measurement capabilities — which will be discussed below — NHTSA's proposed new test dummies offer significantly improved biofidelity and measurement capabilities compared to the SID-H3 and SID 50th percentile male dummies, used in the FMVSS's Nos. 201 and 214 respectively. Furthermore, NHTSA's changes to the ES-2re dummy to fix the rib and to ensure accurate chest deflection measurement appear adequate.

Public Citizen also appreciates the attention given to the safety of small females, as demonstrated by the inclusion of the SID-HIIsFRG 5th percentile female dummy in testing in addition to the ES-2re 50th percentile male dummy. In addition, the seating positions of the two dummies — the 50th percentile male dummy in the FMVSS No. 214 seating position near the "B" beam, and the 5th percentile female dummy in the full-forward seating position — is critical, because it will assure that air bags installed by the manufacturers to comply with the standard will provide a relatively broad zone of protection. Public Citizen strongly supports this aspect of the agency's proposal.

Bringing Together the Protection Elements of Standards Nos. 201 and 214

On the whole, the proposed standard responds to the July 1998 petition by Advocates for Highway and Auto Safety (Advocates), which requested a pole test for a unified side impact regulation; an upgrade of side impact protection for both head and torso; the bringing together of FMVSS Nos. 201 and 214; and new dummies with the superior ES-2re measurement capabilities..[6] The proposed standard also adopts Advocates' request for the pole test to apply to all passenger vehicles up to 10,000 lbs. Gross Vehicle Weight Rating (GVWR), would prevent automakers from simply applying foam or padding instead of head and torso side impact air bags. We strongly support the inclusion of vehicles up to 10,000 lbs. GVWR.

NHTSA's Rejection of Europe's Side Impact Protection Standard Is Correct

The unique passenger vehicle fleet composition in U.S., with its large and still growing population of light trucks, warrants different safety regulations than Europe. Public Citizen is pleased that NHTSA seems to recognize this in the notice of the side impact rulemaking. The pole test is appropriately not adopted from European safety standards, although it could be used as a model for improving side impact protection in Europe.

Flaws in the Agency's Proposal

While many aspects of the rule will significantly improve protection in side impact crashes, the proposed standard is flawed in several critical ways.

Older Occupants Are Left Out and Left Vulnerable

The proposed standard leaves older drivers at unacceptably high risk in side impact crashes. The harm thresholds are simply too low for older occupants, who are more fragile and tend to have more preexisting conditions. The proposed standard involves test dummies with injury response data normalized to represent a middle-age occupant's AIS injury risk distributions, which would significantly underestimate the higher risks of injury faced by occupants over the age of 65.

Moreover, the AIS risk percentage distributions and injury response thresholds are not based on actual correlation with documented patient outcomes in trauma medicine,

especially for occupants over 65 years of age, but rather are derived only from tests on cadavers and dummies.

Rear Occupants Are Left Vulnerable

Public Citizen deems it unacceptable that the pole test be proposed for the front and not the rear seat areas. The movable deforming barrier (MDB) test is no surrogate for the pole test. The MDB is not as rigorous as the pole test and would not necessitate equivalent protection for rear occupants, particularly in terms of minimal head protection. Manufacturers could continue to get away with mere padding for rear occupant side-impact head and torso protection.

Child Occupants Are Left Vulnerable

One of the most striking failures of the proposed standard is its near-complete neglect of child safety. In fact, child safety is never quantitatively discussed in the entire notice of proposed rulemaking. The proposed pole test, as well as the MDB test, does not involve a child dummy. Therefore, children below about 12 years of age, in either the front or rear seats, could submarine under any air bag systems installed to comply with the proposed standard, and the agency has no system to measure the impact of the rule upon children. Since children, especially smaller children, are, thanks to NHTSA's efforts, usually seated in the rear of the vehicle, they would be made particularly vulnerable by the proposed rulemaking because it neither subjects the rear seat area to the pole test, nor uses an MDB test that is sufficiently severe to require adequate protection for this population. NHTSA should both include a child dummy in its current rulemaking and enlarge this rulemaking to assure better protection for all occupants, including children, in the rear seat.

Women Occupants Are Also Left Vulnerable

We have serious concerns that the proposed standard will leave women occupants with insufficient side impact protection, particularly for the chest and pelvis. The agency should reexamine its proposal that chest deflection limits not apply to the 5th percentile female SID-HIIsFRG dummy. Moreover, it is highly problematic that the SID-HIIsFRG, unlike the ES-2re male dummy, is unable to measure force on the pubic symphysis. As the agency itself notes in its proposal, the pubic symphysis is "the region of the pelvis where the majority of injuries occur." [7] This is particularly true in regards to the safety of older women because of their susceptability to osteoporosis.

The MDB Test Does Not Replicate a Striking LTV

The long-outdated MDB test maintained by the proposed standard falls well short of representing a side impact crash because the MDB continues to simulate the front of a midsized passenger car. This MDB test does not require adequate side impact protection for occupants in vehicles hit by higher, stiffer, and heavier light trucks.

The agency's failure to adopt a standard that adequately mimics the crash dynamics of today's vehicle fleet disadvantages all occupants, but particularly rear occupants, who do not benefit under this proposal from protections enforced by a pole test. For rear occupant protection, manufacturers could comply with the MDB portion of the test by simply installing padding. Children are especially vulnerable because they are usually seated in the back seats and are more likely to suffer head injuries from an intruding SUV or pickup truck because of their height.

Moreover, it is unacceptable that light trucks with GVWR greater than 6,000 lbs. be exempt from the MDB test. The agency provides no data to backup its claim that applying the MDB test to heavier light trucks would provide no safety benefit, and the maneuver seems to be born more out of concern for the automakers' bottom line than for safety. The MDB test should be a requirement for vehicles up to 10,000 lbs. GVWR.

NPRM Inadequately Protects Against Ejection

Despite the fact that ejection prevention is one of the two stated goals of this rulemaking,[8] the proposed standard is completely inadequate in addressing this issue. About 20 percent of those killed are either fully or partially ejected from their vehicle.[9] It is truly outrageous that NHTSA would allow compliance with the standard even if a struck side door became unlatched during testing, so long as it did not become detached from the vehicle. An unlatched door would leave an occupant at a severely elevated risk of full or partial ejection, and ejected occupants are three times as likely to be killed as occupants who remain in the vehicle during the crash.[10]

The pole test does not require that manufacturers install side *curtain* air bags, which are much more effective at preventing ejection than non-curtain side impact air bags, such as inflatable tubes. This is despite the fact that there are about 5,400 ejections annually through the front side windows, about 2,200 of them full ejections of the occupant.[11] A minimally compliant air bag design, solely for front seat occupants and using a combination head-torso two-sensor bag, could still allow partial or even complete ejection of front seat occupants. Compliance with the proposed standard could leave rear occupants without any side impact air bag protection, therefore increasing their risk of ejection. This is especially true for children, who are usually placed in the rear seating area.

The failure of the proposed standard to ensure adequate occupant protection against ejection is particularly distressing because of the potential for a rollover following an initial side impact. For example, not only would the unlatching of a side door from a side impact increase the likelihood of immediate occupant full or partial ejection, but a subsequent rollover would impose a massive risk of occupant ejection. Sixty percent of people killed in rollovers are either partially or fully ejected from the vehicle.[12] NHTSA should require that vehicle doors remain latched throughout both tests, or it will, unconscionably, unnecessarily put occupants at risk.

Dubious Vehicle Exemptions Must Be Removed

Many of the proposed vehicle exemptions in this rulemaking are dubious at best. As already mentioned, it is completely unacceptable that vehicles with GVWR greater than 6,000 lbs. be excluded from the MDB test. This proposed appears purely motivated by a desire to contain industry costs, in contradiction of the agency's mission to ensure adequate side impact protection for all.

We also question NHTSA's rationale for excluding vehicles with either no doors or removable doors from the pole test because of their "unusual side structures," low floor, or high roof.[13] The agency provides no data to actually back up claims that compliance would be more difficult. Even if these factors make the proposed pole test impractical for these specific passenger vehicles, at a minimum the agency should provide an adjusted test requirement that offers a similar level of stringency as the pole test. Likewise, NHTSA proposes to exclude convertibles from the pole test because they lack a roof structure allowing the installation of an air bag, but the agency offers no alternative proposal for ensuring acceptable side impact protection. This proposal is similarly lacking in reason, and the test should be adapted to require some enhancement in side protection for occupants of these vehicles, as the agency's own reasoning suggests that these occupants may face a relatively higher risk from impacts. Overall, the agency's wholesale approach to exemptions must be replaced by an approach which demands appropriate and possible improvements in side impact crash protection in all types of vehicles.

Pole Test Phase-in Should Begin Sooner

While the proposed three-year phase-in period for the pole test is acceptable, it would not start until 2009, meaning a full fleet phase-in of the new safety standard would not be reached until 2011. This slow phase-in needlessly inflicts on the public thousands of preventable injuries and deaths.

With thousands of deaths and injuries potentially preventable with the implementation of this safety standard, time is the essence. We strongly recommend that the NHTSA move up the phase-in period for the proposed pole test. The phase-in should start in 2007 so as to be complete by 2009. This is supported by the test results cited in the notice of the rulemaking notice, which includes data from testing on a variety of vehicles and suggests that the majority of vehicles could comply relatively quickly with this new standard.[14]

RECOMMENDED IMPROVEMENTS TO THE STANDARD

A Pole Test Should Be Required for Rear as well as Frontal Seating Areas

The most crucial improvement to the proposed standard would be addition of a mandatory pole test for the rear seating areas. This addition would significantly improve rear occupant safety by requiring manufacturers to install head protection side air bags

for rear occupants. It would especially improve protection for more fragile occupants like the elderly, as well as for children, who are often seated in the rear of the vehicle. Moreover, the pole test would provide rear occupant much more protection than the MDB test — even if the MDB test was significantly upgraded through the use of a more massive, higher, rigid MDB than is currently used for compliance with FMVSS No. 214.

Public Citizen is very concerned that the agency did not impose a pole test on the rear seating area to reduce costs for industry, rather than for legitimate safety reasons. "We have also sought to contain the costs of this rulemaking," NHTSA states in the rulemaking notice. "Applying the test to rear seats would require at least twice as many tests per vehicle."[15] This focus on cost above occupant protection is misplaced and contrary to the agency's mission. As the agency was reminded in the tire pressure monitoring case, its rulemakings should place "a thumb on the safety side of the scale."

Intrusion Prevention Requirement in Pole Test

We recommend that the agency examine the potential for adding an intrusion limit to the pole test, in addition to the crash dummy injury criteria. This would regulate the amount of pole intrusion into the occupant survival space permitted for compliance with the standard. The level of intrusion into the occupant space is closely correlated with the level of occupant injury risk, and therefore support for this additional calculation is likely strong.[16]

Improve Test Dummy Injury Response Data to Take into Consideration the Higher Vulnerability of Older Occupants

While the proposed test dummies are notably superior to the SID-H3 and SID 50th percentile male test dummies used in FMVSS Nos. 201 and 214 respectively, the new dummies should have injury response data normalized to take into account the higher risks of injury faced by occupants over 65 years of age. In redesigning its injury criteria, documented patient outcomes in trauma medicine — particularly for occupants over 65 years of age — should be used, not just the results of tests involving cadavers and dummies. For example, in a study by the Crash Injury Research & Engineering Network (CIREN) — a part of NHTSA — showed that the motor vehicle crash victims studied who were over the age of 60 had twice the fatality rate of younger crash victims studied. Moreover, older crash victims on average sustained more severe injuries than younger crash victims for any given crash severity.[17] We note that such changes to the standard may require at least some manufacturers to redesign their side impact air bags, particularly pelvic and torso protection air bags. This is particularly important given the aging of the population and the higher numbers of retirement-level drivers and passengers.

Child Dummy Should Be Included in Side Impact Protection Standard

A child test dummy should be included in pole tests of both the rear and frontal seating areas of the vehicle in order to ensure the necessary level of protection for

children in side impact crashes, as well as to ensure side air bag safety for children. The child test dummy injury response measurement capabilities should parallel those of the ES-2re 50th percentile male dummy, and the child dummy's kinematics should be similarly realistic. Furthermore, the injury response data should be normalized to take into account the special risks of injury faced by child occupants. For example, their lower seated height makes them more vulnerable to head injury from a side impact crash. We acknowledge that inclusion of a child dummy as proposed here would potentially require the redesign of some manufacturers' side impact air bags to ensure appropriate and safe deployment, and believe that this is a worthy goal. NHTSA should and must do a better job of insisting that cars accommodate the real-world safety needs of children.

Head Injury Threshold Should Be Lowered

Public Citizen believes that the proposed head injury threshold is unnecessarily high and should be lowered. The proposed ceiling of HIC 1000 — meaning a 52 percent of serious injury or death — is dangerously lax and should be lowered to HIC 800, which corresponds with, approximately, a 35 percent risk of serious or fatal head injury.

Data from the vehicle testing done by the agency, as provided in the rulemaking notice, suggests manufacturers could quickly bring into compliance most vehicles by simply ensuring adequate side impact air bag systems are installed. However, in tests in which HIC scores exceeded 1000, the air bag system installed failed to prevent contact between the dummy's head and the pole. This was particularly true for tests with the smaller test dummy, the SID-HIIsFRG. This indicates a need for larger, broader, more protective air bags in these vehicles. But most tested vehicles passed the pole test and with HIC scores well below 800.[18] The proposed standard should not lower the bar on safety simply because the correct standard is more stringent than the current standard.

If the MDB Test Is To Continue as Part of the Standard, It Should Be Far More Severe

Public Citizen would like to see the pole test applied to both rear as well as frontal seating areas of passenger vehicles. Furthermore, the mass, height, ground clearance and stiffness of the MDB should be raised to reflect a large light truck. For example, the mass of the MDB should be raised to at least 4,000 lbs. Please note that Public Citizen believes the new IIHS side impact MDB test should *not* be used as a model for these changes: the MDB used in the new IIHS test does not adequately simulate a large light truck because it is too light, low and flexible. For example, the MDB used by IIHS weighs only about 3,300 lbs. — far less than the 4,700 lbs.-average for 2004 model year light trucks.[19] The agency should develop a more demanding MDB and use that to supplement rear seat and side structure occupant protection.

Thank you for your consideration of our comments.

Sincerely,
Joan Claybrook
President, Public Citizen

Endnotes

[1] National Center for Statistics and Analysis, National Highway Traffic Safety Administration, Occupant Fatalities in Vehicles with Side Initial Impact by Year, Restraint Use, Ejection, and Vehicle Body Type. FARS 1991-2001 FINAL & 2002 ARF, Washington, DC: NHTSA, Sept. 2003.
[2] National Highway Traffic Safety Administration, 2003 Annual Assessment of Motor Vehicle Crashes, Washington, D.C.: NHTSA, August 2004, at 98.
[3] Van Auken, R.M., and J.W. Zellner. A Further Assessment of the Effects of Vehicle Weight and Size Parameters on Fatality Risk in Model Year 1985-98 Passenger Cars and 1985-97 Light Trucks (DRI-TR-03-01) Torrance: Dynamic Research, Inc., Jan. 2003, at 3.
[4] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 27991.
[5] Status Report, Insurance Institute for Highway Safety, Vol. 38, No. 9, September 25, 2003.
[6] Stone, Judith Lee, Advocates for Highway and Auto Safety, Petition to Open Rulemaking on Federal Motor Vehicle Safety Standard 214 Side Impact Protection, Washington, D.C., July 8, 1998, at http://dmses.dot.gov/docimages/pdf29/41873_web.pdf.
[7] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 28003.
[8] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 27991.
[9] National Center for Statistics and Analysis, National Highway Traffic Safety Administration, Occupant Fatalities in Vehicles with Side Initial Impact by Year, Restraint Use, Ejection, and Vehicle Body Type. FARS 1991-2001 FINAL & 2002 ARF, Washington, DC: NHTSA, Sept. 2003.
[10] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 27998.
[11] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 27998.
[12] National Center for Statistics and Analysis, National Highway Traffic Safety Administration, Occupant Fatalities in Vehicles with Rollover by Year, Restraint Use, Ejection, and Vehicle Body Type. FARS 1991-2001 FINAL & 2002 ARF, Washington, DC: NHTSA, Sept. 2003.
[13] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 27996.
[14] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 28008-28011.
[15] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 28011.
[16] Kaufman, Robert and C. Mock, Crash Injury Research & Engineering Network, NHTSA, "Injury Patterns in Side Impacts: The Effects of Door Panel Stiffness, Geometry and Intrusion," Presentation, Seattle: CIREN / Harborview Medical Center, 2000, <http://www-nrd.nhtsa.dot.gov/pdf/nrd-50/CIREN/2000/0700Seattle.pdf>.
[17] Wang, Stewart C., Crash Injury Research & Engineering Network, NHTSA, "An Aging Population: Fragile, Handle with Care, CIREN, <http://www-nrd.nhtsa.dot.gov/departments/nrd-50/ciren/um_fragile.html>.
[18] Side Impact Protection, Notice of Proposed Rulemaking, 69 FR 27990 et seq., May 17, 2004, at 28004-2800.
[19] Hellman, Karl *et al.*, Office of Transportation and Air Quality, Environmental Protection Agency, *Light-Duty Vehicle Technology and Fuel Economy Trends*, Report EPA420-R-04-001, Washington, D.C.: EPA, April 2004, at 8.